

**Reliable high voltage gate dielectric layers using a dual
nitridation process**

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ABSTRACT OF THE INVENTION

Dual gate dielectric layers are formed on a semiconductor substrate for MOS transistor fabrication. A first dielectric layer (30) is formed on a semiconductor substrate (10). A first plasma nitridation process is performed on said first dielectric layer. The first dielectric layer (30) is removed in regions of the substrate and a second dielectric layer (50) is formed in these regions. A second plasma nitridation process is performed on the first dielectric layer and the second dielectric layer. MOS transistors (160, 170) are then fabricated using the dielectric layers (30, 50).